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SCIENCE

FRIDAY, MAY 11, 1917

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MSS. intended for publication and books, etc., intended for review should be sent to Professor J. McKeen Cattell, Garrison-on-Hudson, N. Y.

THE MAKING OF SCIENTIFIC THEORIES¹

THE ancient Hebrews conceived the earth to be a disk hemmed in on all sides by mountains and surmounted by the crystal dome or firmament of the "heavens." This covered disk floated upon "the waters under the earth" and from the "windows of heaven" waters were poured out upon the "thirsty earth" from another reservoir which was above the firmament. To the denizen of the humid temperature regions it is perhaps a little difficult to see how this theory could have come into existence. The rains with which he is so familiar are showers, and they suggest not so much windows in the sky as they do a ceiling with innumerable perforations or some other glorified sprinkling device. To the Children of Israel the phenomenon of showers was unknown, for the rains to which they had become accustomed both during their wanderings in the desert of Sinai and in Palestine, were of the local downpour or cloudburst type, the characteristic precipitation of the arid lands. So also their country was one in which earthquakes have been frequent, and they were not unaccustomed to seeing the earth open and water shoot upward from the fissures in much the same manner that it spurts into the hold of a ship from the opening of a seam. This oft-observed phenomenon is with little doubt responsible for the conception of the "waters under the earth" referred to in the twentieth chapter of Exodus. We see, therefore, that this crude theory of the

¹ Address of the president of the Michigan Academy of Science, delivered at the Annual Meeting in Ann Arbor, March 28, 1917.